Argonne NATIONAL LABORATORY

ParaView on Eureka

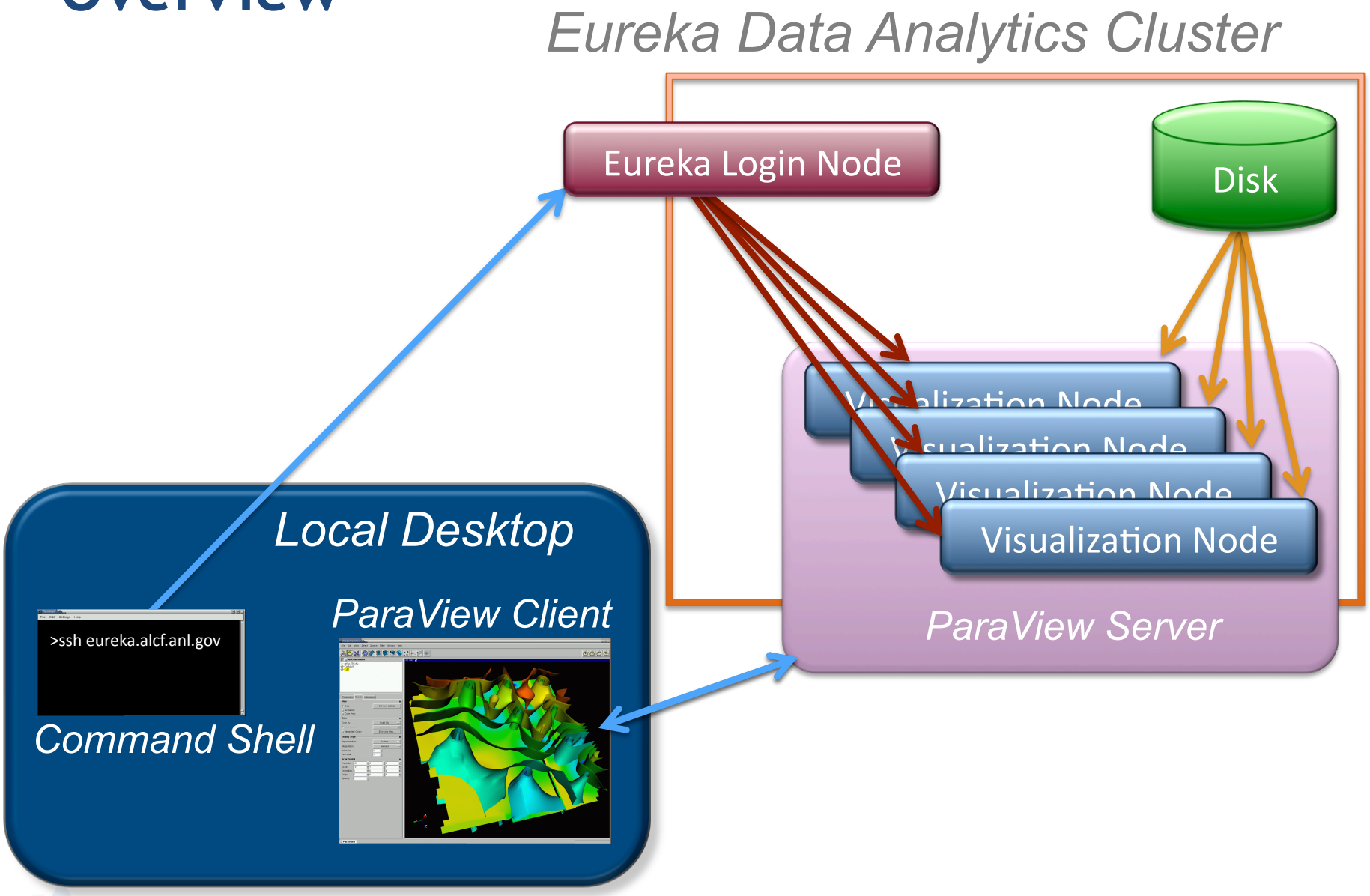
Running a Parallel Server with a Local Client

U.S. DEPARTMENT OF ENERGY

Goals

- Overview of ParaView on Eureka
- Install ParaView on your laptop
- Run ParaView Server on Eureka
  - Set up user environment on Eureka
  - Launch ParaView Server
- Run ParaView Client on laptop
  - Set up ssh tunnel
  - Configure server
  - Connect
- Explore some data

Overview


Eureka Data Analytics Cluster
Eureka Login Node
Disk
Visualization Node
Visualization Node
Visualization Node
Visualization Node
ParaView Server
Local Desktop
ParaView Client
>ssh eureka.alcf.anl.gov
Command Shell

Install ParaView on Your Laptop

- Client and Server versions must match
  - ParaView 3.14
- paraview.org/paraview/resources/software.php
- Binaries available for
  - Windows
  - Linux
  - MacOS

Setting up the client and server

- Will need 2 shell windows (one local, one on eureka)

Set Up User Environment (Eureka)

This only needs to be done once

Put ParaView in your environment

- Edit ~/.softenvrc
  - @paraview-3.14.1
  - (must go before @default)
  - Does not play well with @visit, only have one or the other
- > resoft

Set Up User Environment (Eureka)

Be sure to use backtick, and not single quote around hostname

This only needs to be done once

Set the DISPLAY

- **Bash** users should add the following to your ~/.bashrc file on Intrepid/Eureka:

```
if ( echo `hostname` | grep -sq 'vs'); then
   export DISPLAY=:0.0
fi
```

- **Csh/Tcsh** users should add the following to your ~/.cshrc file on Intrepid/Eureka:

```
if( `hostname` =~ '*vs*' ) then
   setenv DISPLAY :0.0
endif
```

Start ParaView Server (Eureka)

Submit an interactive job

the <NUM> should match for -n <NUM> and -np <NUM> in these two commands

- From a login shell on Eureka:

```
login1.eureka:~> qsubi -n 4 -t 60
```

If you have multiple projects include : `–A project_id`

- This will put you on the head node of your job. Take note of the hostname.
- Launch the ParaView server:

```
vs37:~>mpiexec -machinefile $COBALT_NODEFILE -np 4
pvserver Listening on port 11111
Waiting for client...
Connection URL: CS://vs37:11111
Accepting Connection(s): vs37:11111
```

Set up ssh tunnel (local host)

Linux / Mac OS / Windows (using Cygwin):

- From a shell on your laptop:

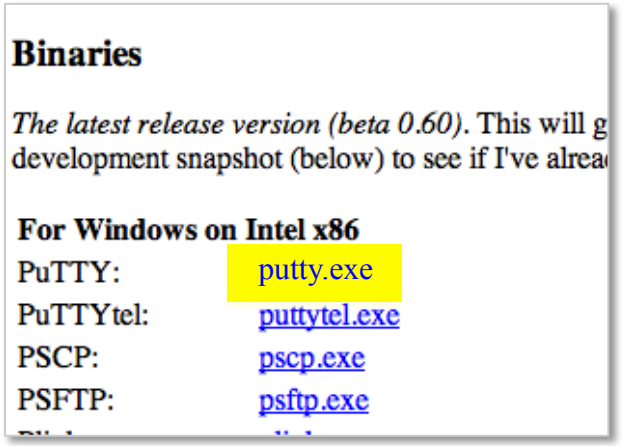
```
~>ssh -NL 11111:vs37:11111 username@eureka.alcf.anl.gov
```

- Replace vs37 with the node where your pvserver is listening (where you ran mpiexec).
- username is your login on Eureka.
- You will be prompted for your CRYPTOcard one time password. After you authenticate, the ssh tunnel will be established, but you won't receive any output or be returned to a command prompt. This is normal. (When your session is complete, use Ctrl^C to close the tunnel).

Set up ssh tunnel (local host)

Windows (using PuTTY):

- Download PuTTY
  - http://bit.ly/pvssh
  - Right-click on putty.exe, Save link as C:\putty.exe
- Create SSH tunnel
  - **Start Command Prompt**
    Start->Programs->Accessories->CommandPrompt
  - **Start PuTTY**




```
c:\putty -ssh –N -L 11111:vs37:11111
                    username@eureka.alcf.anl.gov
```

Type your CRYPTOcard one time password when prompted

Start ParaView (local host)

Start ParaView on your local resource

- Method will vary by platform

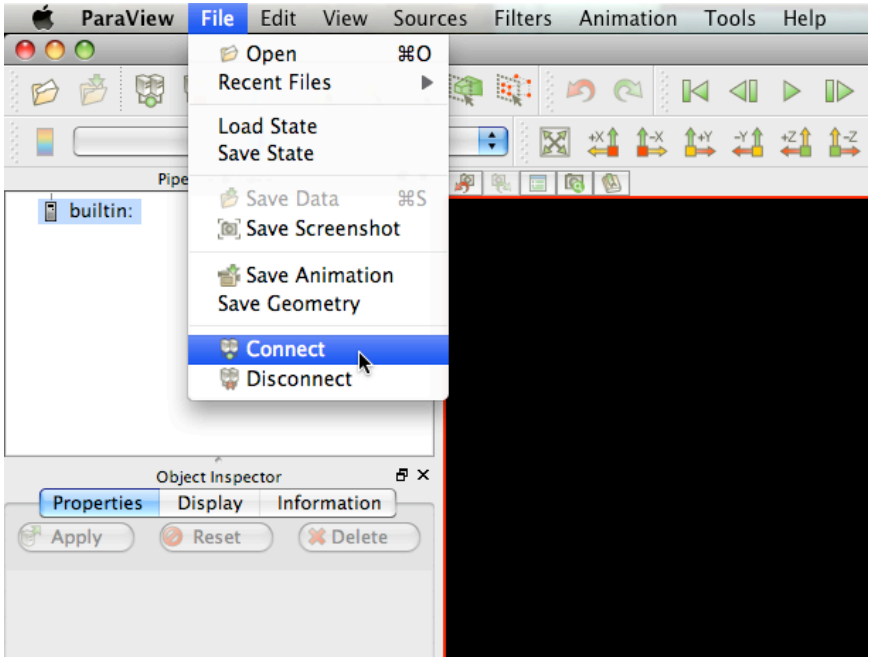
In order to connect to our running pvserver, we will need to configure some server settings in the client. This should only need to be done once, and can be reused each time you run ParaView on Eureka.

Connect to Server

Select Connect

- From the ParaView client choose to connect to a server by either clicking on the "Connect" icon in the menu bar, or from the main menu select:

  `File->Connect`

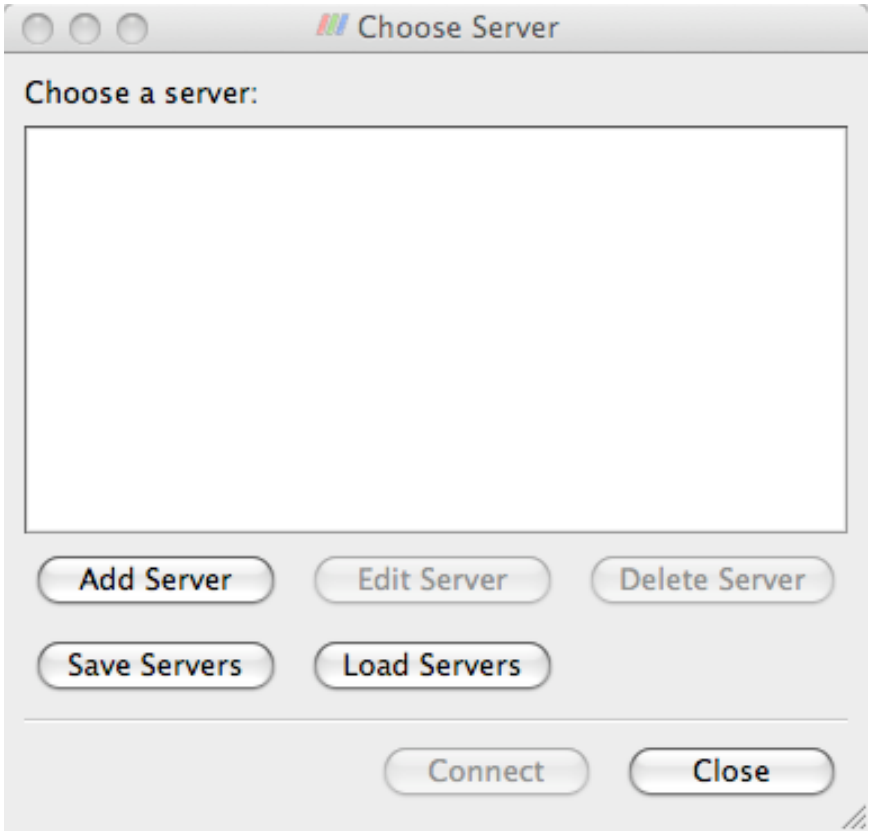


Server Configuration

Add a new server (first time only)

- Once set up, this server can be reused each time we connect the ParaView client to the pvserver on Eureka.
- Click:

  `Add Server`

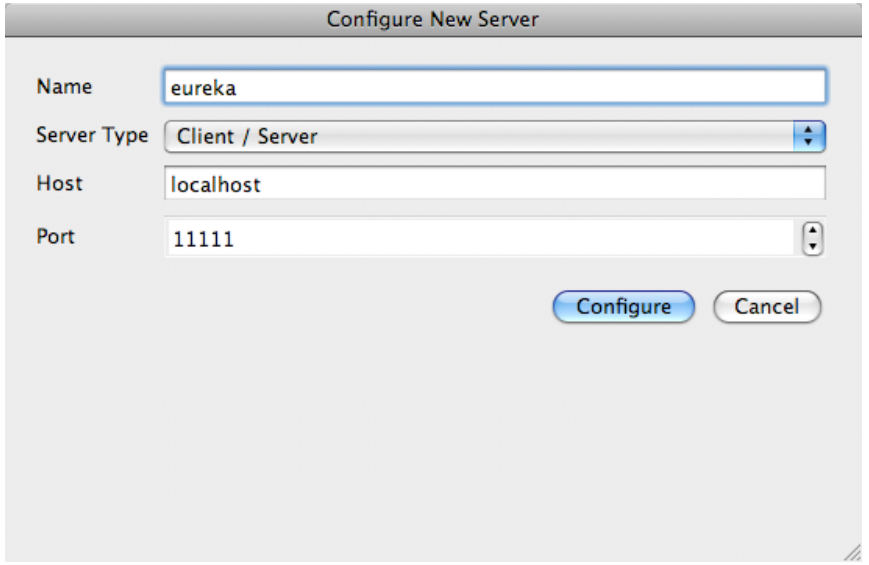


Server Configuration

Configure Server, part 1 (first time only)

- Give the server a **Name**, such as *eureka*
- Select **Server Type**: Client/ Server
- The **Host** and **Port** values can be left as the defaults, *localhost* and *11111*
- Click:

  `Configure`



Server Configuration

Configure Server, part 2 (first time only)

- Because we are going to connect to a ParaView server that we have already started, we don't need the ParaView client to start a server for us.
- Select **Startup Type**: Manual
- Click:

  Save

Choose Server / Connect

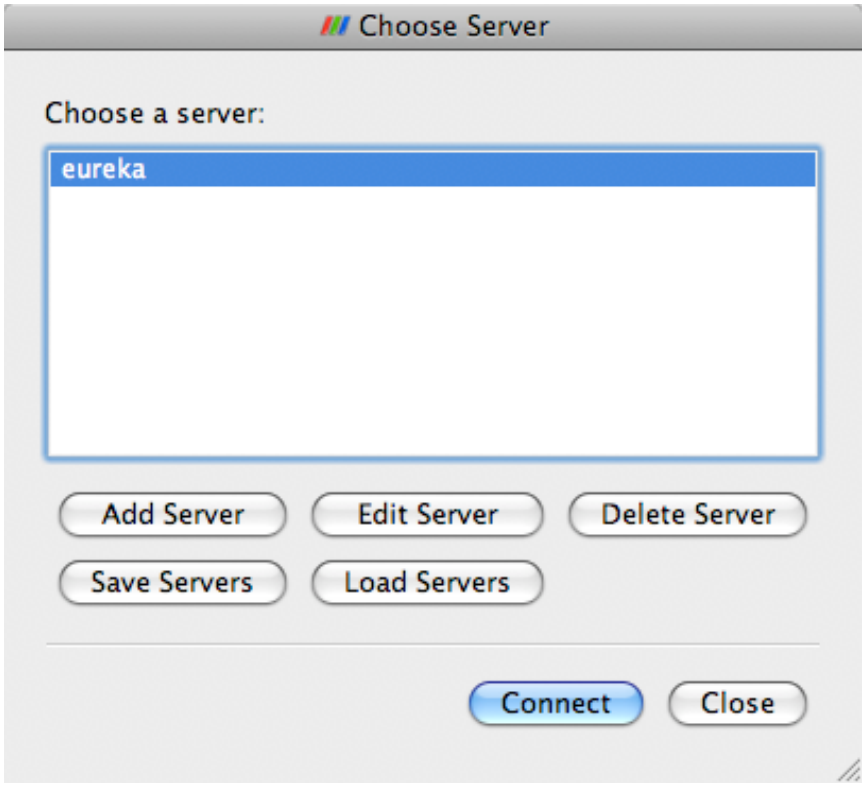
Connect to Server

- Now that we have a server defined and configured, highlight it in the list.
- Click:

  `Connect`

- Now when you select

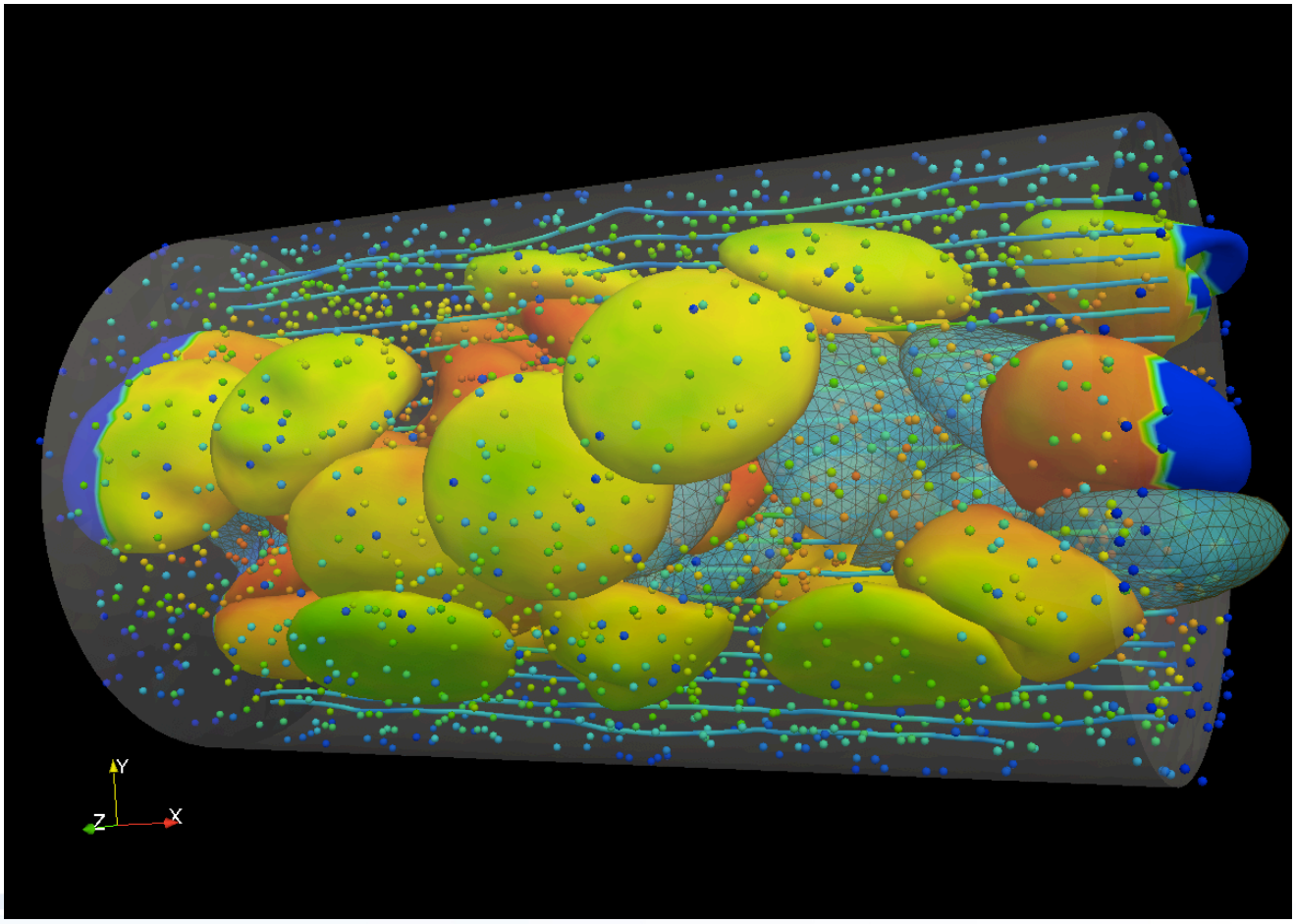
  `File->Open` from the main menu, you will be browsing the file system on Eureka.



Example data: take it for a spin…

Blood Flow Data

- /intrepid-fs0/projects/fl/DATA/BLOODFLOW_TUTORIAL_DATA/



Example data: take it for a spin…

Supernova Data

- /intrepid-fs0/projects/fl/DATA/BLONDIN/
- See README file
- Format: raw (binary)
- Data Type: float
- Byte Order: Little Endian
- Data Extents:
  - 0 – 431
  - 0 – 431
  - 0 – 431